

WHAT IS CLAIMED IS:

1. A heat absorb-release plastic resin composition comprising a matrix resin material and a phase transition material that has lower fusion-crystallization temperature than the matrix resin and has 10J/g
5 or more of heat absorb or heat release amount at a lower temperature than a fusion temperature of the matrix resin,

said heat absorb-release plastic resin composition satisfying one of the following requirements:

- a) Flexural Modulus being 3000 Kg/cm² or more,
- 10 b) room temperature heat conductivity being 0.4 W/m-K or more, and
- c) Flexural Modulus being 3000Kg/cm² or more, and room temperature heat conductivity being 0.4 W/m-K or more.

2. The heat absorb-release plastic resin composition according to
15 claim 1, wherein the resin composition has thermal conductivity satisfying the following Equation 1, when contacts with a liquid phase medium:

[Equation 1]

$$\left(\frac{hd}{k} \right) < 1$$

20 wherein, h is heat transfer coefficient (W/m²K) of the composition, d is a thickness of the composition, and k is thermal conductivity(W/m-K) of the composition.

3. The heat absorb-release plastic resin composition according to

claim 2, wherein the resin composition has heat conductivity satisfying the following Equation 2, when contacts with a liquid phase medium:

[Equation 2]

$$\left(\frac{hd}{k} \right) < 0.1$$

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wherein, h is heat transfer coefficient (W/m²K) of the composition, d is a thickness of the composition, and k is thermal conductivity(W/m-K) of the composition.

4. The heat absorb-release plastic resin composition according to claim 1, wherein the resin composition has heat conductivity
10 satisfying the following Equation 3, when contacts with a solid phase medium:

[Equation 3]

$$\frac{d}{k} < \frac{d_a}{k_a}$$

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wherein, d is a thickness (m) of the composition, k is thermal conductivity (W/m-K) of the composition, and d_a and k_a respectively are thickness and thermal conductivity of material contacted with the composition.

5. The heat absorb-release plastic resin composition according to claim 1, wherein the composition comprises 10 to 95 parts by weight
20 of matrix resin material; and 5 to 90 parts by weight of phase transition material.

6. The heat absorb-release plastic resin composition according to claim 1, wherein the matrix resin material is selected from the group consisting of polybutylene terephthalate, polyethylene terephthalate, aromatic polyamide, polyamide, polycarbonate, polystyrene, 5 polyphenylene sulfide, thermal emitting liquid crystal polymer, polysulfone, polyether sulfone, polyether imide, polyether ether ketone, polyarylate, polymethyl methacrylate, polyvinylalcohol, polypropylene, polyethylene, polyacrylonitrile-butadiene-styrene copolymer, polytetramethyleneoxide-1,4-butanediol copolymer 10 (polybutylene terephthalate elastic body), a styrene containing copolymer, fluorine-based resin, polyvinylchloride, polyacrylonitrile, and a mixture thereof.

7. The heat absorb-release plastic resin composition according to claim 1, wherein the phase transition material is selected from the 15 group consisting of zeolite powder, calcium bichloride, crystalline paraffin wax, polytriphenyl phosphate, polyethyleneglycol, fatty acid, naphthalene, polyepsilon caprolactone, polyethylene oxide, polyisobutylene, polycyclopentene, polycyclooctene, polycyclododecen, polyisoprene, polyoxytriethylene, 20 polyoxytetramethylene, polyoxyoctamethylene, polyoxypropylene, polybutyrolactone, polyvalerolactone, polyethyleneadipate, polyethylene suberate, polydecamethylazelaate, and a mixture thereof.

8. The heat absorb-release plastic resin composition according to claim 1, further comprising a compatibilizer selected from the group

consisting of maleic anhydride olefin copolymer, vinylacetate olefin copolymer, polyolefin copolymerized with amide group, styrene-ethylene-butadiene-styrene copolymer, styrene-butadiene-styrene copolymer, and a mixture thereof.

5 9. The heat absorb-release plastic resin composition according to claim 1, further comprising a compatibilizer selected from the group consisting of maleic anhydride olefin copolymer, vinylacetate olefin copolymer, polyolefin copolymerized with amide group, styrene-ethylene-butadiene-styrene copolymer, styrene-butadiene-styrene
10 copolymer, and a mixture thereof.

10. The heat absorb-release plastic resin composition according to claim 1, further comprising a thermally conductive solid additive having thermal conductivity of 5 W/m-K in an amount of 5 to 90 parts by weight, based on 100 parts by weight of the sum of the matrix
15 resin material and the phase transition material.

11. The heat absorb-release plastic resin composition according to claim 10, wherein the thermally conductive solid additive is selected from the group consisting of copper, silver, gold, steel, nickel, silicon carbide, silicon, boron nitride, boron azenide, boron phosphide,
20 diamond, beryllium oxide, beryllium sulfide, aluminum nitride, aluminum phosphide, gallium nitride, gallium phosphide, and a mixture thereof.

12. The heat absorb-release plastic resin composition according to claim 1, further comprising a reinforcing additive selected from the

group consisting of glass fiber, carbon fiber, talc, glass flake, mica, carbon black, carbon nanotube, and a mixture thereof, in an amount of 1 to 30 parts by weight, based on 100 parts by weight of the sum of the a) matrix material and the b) phase transition material.

5 13. A molded product prepared from the heat absorb-release plastic resin composition of claim 5.

14. The molded product according to claim 13, wherein the resin composition has thermal conductivity satisfying the following Equation 1, when contacts with a liquid phase medium:

10 [Equation 1]

$$\left(\frac{hd}{k} \right) < 1$$

wherein, h is heat transfer coefficient (W/m²K) of the composition, d is a thickness (m) of the composition, and k is thermal conductivity (W/m-K) of the composition.

15 15. The molded product according to claim 13, wherein the resin composition has thermal conductivity satisfying the following Equation 3, when contacts with a solid phase medium:

[Equation 3]

$$\frac{d}{k} < \frac{d_a}{k_a}$$

20 wherein, d is a thickness (m) of the composition, k is thermal conductivity (W/m-K) of the composition, and d_a and k_a respectively are thickness and thermal conductivity of material contacted with the

composition.

16. The molded product according to claim 13, wherein the matrix resin material is selected from the group consisting of polybutylene terephthalate, polyethylene terephthalate, aromatic polyamide, polyamide, polycarbonate, polystyrene, polyphenylenesulfide, thermal emitting liquid crystal polymer, polysulfone, polyethersulfone, polyether imide, polyether ether ketone, polyarylate, polymethylmethacrylate, polyvinylalcohol, polypropylene, polyethylene, polyacrylonitrile-butadiene-styrene copolymer, polytetramethylene oxide-1,4-butanediol copolymer (polybutylene terephthalate elastic body), styrene containing copolymer, fluorine-type resin, polyvinyl chloride, polyacrylonitrile, and a mixture thereof.

17. The molded product according to claim 13, wherein the phase change material is selected from the group consisting of zeolite powder, calcium bichloride, crystalline paraffin wax, polytriphenylphosphate, polyethyleneglycol, fatty acid, naphthalene, polyepsilon-caprolactone, polyethyleneoxide, polyisobutylene, polycyclopentene, polycyclooctene, polycyclododecene, polyisoprene, polyoxytriethylene, polyoxytetramethylene, polyoxyoctamethylene, polyoxypropylene, polybutyrolactone, polyvalerolactone, polyethylenedipate, polyethylene suberate, polydecamethyl azelate, and a mixture thereof.

18. The molded product according to claim 13, wherein the plastic resin composition is selected from the group consisting of maleic

anhydride olefin copolymer, vinylacetate olefin copolymer, polyolefin copolymerized with amide group, styrene-ethylene-butadiene-styrene copolymer, styrene-butadiene-styrene copolymer, and a mixture thereof.

- 5 19. The molded product according to claim 13, further comprising a thermally conductive solid additive having thermal conductivity of 5 W/m-K or more in an amount of 5 to 90 parts by weight, based on 100 parts by weight of the sum of the matrix resin material and the phase transition material.
- 10 20. The molded product according to claim 13, further comprising a reinforcing additive selected from the group consisting of glass fiber, carbon fiber, talc, glass flake, mica, carbon black, carbon nanotube, and a mixture thereof, in an amount of 1 to 30 parts by weight, based on 100 parts by weight of the sum of the a) matrix resin material and
- 15 the b) phase change material.